

WHAT IS CLAIMED IS:

1. A composition comprising a geminally disubstituted olefin-carbon monoxide-ethylene polymer.

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2. The composition of claim 1 wherein said polymer comprises a polymer having a number average molecular weight of from about 200 to about 150,000.

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3. The composition of claim 1 wherein said geminally disubstituted olefin comprises isobutylene.

4. The composition of claim 1 wherein said polymer comprises 1-40 mole % of said geminally disubstituted olefin, 3-40 mole % of said carbon monoxide, and 5-80 mole % of said ethylene.

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5. The composition of claim 1 wherein said polymer further comprises a monomer X, wherein said monomer X comprises a free radical polymerizable monomer or mixtures of monomers.

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6. The composition of claim 5 wherein said monomer X is selected from the group consisting of C₃ to C₃₀ alpha-olefins, C₃ to C₃₀ internal olefins, styrene, styrene derivatives, unsaturated mono- and dicarboxylic acids of 3-20 carbon atoms, esters of such unsaturated mono- and dicarboxylic acids, vinyl esters of saturated carboxylic acids wherein the acid group has 1-18 carbon atoms, vinyl alkyl ethers wherein the alkyl group has 1-18 carbon atoms, halogenated ethylene derivatives, methyl vinyl ketone, 1-vinylpyrrolidone, acrylonitrile, acrylamide, acrolein, allyl alcohol, allyl chloride, allyl acetate, and mixtures.

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7. The composition of claim 5 wherein said mixtures of monomer X are selected from one of raffinate I and raffinate II.

5 8. A polymerization method comprising reacting a geminally disubstituted olefin feed, a carbon monoxide feed and an ethylene feed under free radical polymerization conditions to form a geminally disubstituted olefin-carbon monoxide-ethylene polymer.

10 9. The method of claim 8 wherein the polymerization conditions range in temperature from about 50°C to about 300°C and range in pressure from about 500 psig to about 30,000 psig.

15 10. The method of claim 8 wherein the polymerization is conducted in the presence of a solvent.

 11. The method of claim 8 wherein the polymerization is conducted in the presence of a free radical initiator.

20 12. The method of claim 11 wherein said free radical initiator is selected from one of organic peroxides and azo compounds.

 13. The method of claim 8 wherein said polymer comprises a polymer having a number average molecular weight of from about 200 to about
25 150,000.

 14. The method of claim 8 wherein said geminally disubstituted olefin comprises isobutylene.

15. The method of claim 8 wherein said polymer comprises 1-40 mole % of said geminally disubstituted olefin, 3-40 mole % of said carbon monoxide, and 5-80 mole % of said ethylene.

5 16. The polymerization method of claim 8 further comprising reacting a feed containing monomer X with said geminally disubstituted olefin feed, said carbon monoxide feed and said ethylene feed under free radical polymerization conditions to form a geminally disubstituted olefin-carbon monoxide-ethylene-X polymer, wherein said monomer X comprises a free
10 radical polymerizable monomer or mixtures of monomers.

 17. The method of claim 16 wherein said monomer X is selected from the group consisting of C₃ to C₃₀ alpha-olefins, C₃ to C₃₀ internal olefins, styrene, styrene derivatives, unsaturated mono- and dicarboxylic acids of 3-20
15 carbon atoms, esters of such unsaturated mono- and dicarboxylic acids, vinyl esters of saturated carboxylic acids wherein the acid group has 1-18 carbon atoms, vinyl alkyl ethers wherein the alkyl group has 1-18 carbon atoms, halogenated ethylene derivatives, methyl vinyl ketone, 1-vinylpyrrolidone, acrylonitrile, acrylamide, acrolein, allyl alcohol, allyl chloride, allyl acetate, and
20 mixtures thereof.

 18. The method of claim 16 wherein said mixtures of monomer X are selected from one of raffinate I and raffinate II.

25 19. A PVC resin composition comprising polyvinyl chloride and a plasticizer selected from the group consisting of: i) a geminally disubstituted olefin-carbon monoxide-ethylene polymer; ii) a geminally disubstituted olefin-carbon monoxide-ethylene-X polymer; and iii) mixtures thereof, wherein said monomer X comprises a free radical polymerizable monomer.

20. A method for a preparing a PVC resin comprising blending polyvinyl chloride with a plasticizer selected from the group consisting of: i) a geminally disubstituted olefin-carbon monoxide-ethylene polymer; ii) a
- 5 geminally disubstituted olefin-carbon monoxide-ethylene-X polymer; and iii) mixtures thereof, wherein said monomer X comprises a free radical polymerizable monomer.